

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

| | | | |
|--|---|---|------------------|
| Applicant's or agent's file reference SA67WO | FOR FURTHER ACTION | | See item 4 below |
| International application No. PCT/JP2004/003326 | International filing date (<i>day/month/year</i>) 12 March 2004 (12.03.2004) | Priority date (<i>day/month/year</i>) 14 March 2003 (14.03.2003) | |
| International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237 | | | |
| Applicant SAKAI CHEMICAL INDUSTRY CO. LTD. | | | |

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input checked="" type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

| | |
|---|--|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland | Date of issuance of this report 13 February 2006 (13.02.2006) |
| Facsimile No. +41 22 740 14 35 | Authorized officer <div style="text-align: center; font-weight: bold;">Yoshiko Kuwahara</div> |
| Telephone No. +41 22 338 90 90 | |

PATENT COOPERATION TREATY

Translation

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

| | | |
|---|---|---|
| To: | | Date of mailing (day/month/year) |
| Applicant's or agent's file reference SA67WO | | FOR FURTHER ACTION See paragraph 2 below |
| International application No. PCT/JP2004/003326 | International filing date (day/month/year) 12.03.2004 | Priority date (day/month/year) 14.03.2003 |
| International Patent Classification (IPC) or both national classification and IPC | | |
| Applicant SAKAI CHEMICAL INDUSTRY CO. LTD. | | |

1. This opinion contains indications relating to the following items:

| | | |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the opinion |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input checked="" type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

| | |
|--|--------------------|
| Name and mailing address of the ISA/JP | Authorized officer |
| Facsimile No. | Telephone No. |

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/003326

Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language
_____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/JP2004/003326

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|------------|-----|
| Novelty (N) | Claims | 2, 3, 5-13 | YES |
| | Claims | 1, 4 | NO |
| Inventive step (IS) | Claims | 2, 3, 5-13 | YES |
| | Claims | 1, 4 | NO |
| Industrial applicability (IA) | Claims | 1-13 | YES |
| | Claims | | NO |

2. Citations and explanations:

Document 1: JP 2001-271064 A (Nemoto & Co., Ltd.), 2 October, 2001 (02.10.01)
 Document 2: JP 2000-144129 A (Director General, Agency of Industrial Science and Technology), 26 May, 2000 (26.05.00)
 Document 3: JP 2000-1672 A (Naotoshi Hirotsu), 7 January, 2000 (07.01.00)
 Document 4: JP 11-67158 A (NEC Home Electronics Ltd.), 9 March, 1999 (09.03.99)
 Document 5: JP 2000-212557 A (OHARA INC.), 2 August, 2000 (02.08.00)
 Document 6: JP 2000-234088 A (Pekin-shi Hodai0ku Kogyo Toso Hokasho), 29 August, 2000 (29.08.00)

Concerning the claims 1, 4:

The document 1 describes a phosphorescent pigment, a compound expressed as MA12O4: M is constituted by a compound comprised of one or more metal element selected out of a group of Ca, Sr, Ba as a base crystal while adding Eu as an activator and at least one or more element out of a group comprised of Bismuth and so forth in 0.01 to 10 mole% as a coactivator to the metal element expressed as M. Tables 7 and 13 indicate alkaline earth metal aluminate phosphor whose activator is divalent europium, which contains Bi.

The document 2 discloses a phosphorescent pigment which is constituted by a base material expressed as MA14O7 while adding Eu as an activator and either Nb, Mo, Ta, W, Bi, etc. in equal to or more than 0.0001 to equal to or less than 20 mole% as a coactivator to the M, and describes Nb or Dy as favorable coactivator (paragraph 0005).

Therefore, the documents 1 to 2 describe alkaline earth metal aluminate phosphor whose activator is divalent europium, which contains Bi or Nb.

Accordingly, the subject matters of claims 1, 4 do not appear to be novel in view of documents 1 to 6.

The documents 3 to 6 describe the addition of Nb, In, W, Bi, etc. to the alkaline earth metal aluminate phosphor whose activator is divalent europium.

A person skilled in the art can easily arrive at an attempt to improve various physical properties by adding Nb, In, W, Bi, etc. to the alkaline earth metal aluminate phosphor whose activator is divalent europium, according to the description of the documents 3 to 6.

Accordingly, the subject matters of claims 1, 4 do not appear to involve an inventive step in view of documents 3 to 6.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/003326

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability:
citations and explanations supporting such statement

Concerning the claims 2, 3, 5 to 13:

The Documents cited in the ISR do not describe the production by firing the alkaline earth metal aluminate phosphor whose activator is divalent europium, to which Nb, In, W, Bi, etc. is added, under the reduction atmosphere before firing under the oxidation atmosphere, or the addition of Nb, In, W, Bi, etc. to a phosphor having a component of $(Ba_{1-x}Sr_x)_{1-y}Eu_yMgAl_{10}O_{17}$, and it is also considered to be non-obvious for a person skilled in the art.

Accordingly, the subject matters of claims 2, 3, 5 to 13 appear to be novel, to involve an inventive step.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/003326

Box No. VI

Certain documents cited

1. Certain published documents (Rule 43bis.1 and 70.10)

| Application No. Patent No. | Publication date (day/month/year) | Filing date (day/month/year) | Priority date (valid claim) (day/month/year) |
|--|--------------------------------------|---------------------------------|---|
| JP 2004-67739 A [E,X], KASEI OPTONIX, LTD. | 04.03.2004 | 02.08.2002 | |
| JP 2003-336056 A [E,X], KASEI OPTONIX, LTD. | 28.11.2003 | 17.05.2002 | |

2. Non-written disclosures (Rule 43bis.1 and 70.9)

| Kind of non-written disclosure | Date of non-written disclosure (day/month/year) | Date of written disclosure referring to non-written disclosure (day/month/year) |
|--------------------------------|--|---|
|--------------------------------|--|---|